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HISTORY
OF
WAR MATERIAL PRODUCTION
OF
THE J. G. BRILL COMPANY, PHILADELPHIA
AND ITS SUBSIDIARY PLANTS
THE G. C. KUHLMAN CAR COMPANY, CLEVELAND
THE AMERICAN CAR COMPANY, ST. LOUIS
THE WASON MANUFACTURING COMPANY., SPRINGFIELD, MASS.

1919

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FOUR YEARS OF WAR EQUIPMENT PRODUCTION AT THE PHILADELPHIA PLANT OF THE J. G. BRILL COMPANY

THE ORGANIZATION

The J. G. Brill Company, electric railway car and truck builders, was originally started in the year 1868, and since that date the development of its business has been steady and so far-reaching that its name is universally known in connection with all classes of electric transportation equipment.

A few years before its incorporation in 1906, the Company acquired control of the American Car Company, St. Louis, Mo., C. C. Kuhlman Car Company, Cleveland, Ohio, John Stephenson Company, Elizabeth, N.J., and the Wason Manufacturing Co., Springfield, Mass., all well-known companies constructing street railway cars. This step was taken in order to adequately handle the rapidly increasing business, and further because of a desire to minimize transportation charges on equipment built for railways operating in the districts adjacent to these various plants.

THE BRILL PLANT

The plant of The J. G. Brill Company, in Philadelphia, Pa., occupies a 30-acre tract of land between the southern lines of the Pennsylvania and Baltimore & Ohio Railroads, in the western part of the city. The entire tract is

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covered with brick and steel shops and buildings, lumber and steel storage sections, railways, traveling cranes and other transfer equipment. When running at capacity production in its normal output of cars and trucks, the plant requires a force of about 3,500 men. The equipment of machinery and facilities for car and truck building are necessarily varied and comprehensive, embracing practically every class of machinery used in quantity production of large and small steel, brass and wood parts.

WAR ORDERS FROM FOREIGN GOVERNMENTS

Soon after the outbreak of the World War, the Brill Company began the manufacture of material for war purposes, first making Automobile Truck Bodies for the transportation of material for troops. These bodies were of many kinds, and were designed at the Brill Plant under the direction of the Military Commission sent to this country by Russia. The types of bodies included Motor Transport or Lorry Bodies, Portable Machine Shop Bodies, Portable Kitchens, Omnibus Bodies for the transportation of Officers, Storage Vans for the transportation of spare parts for automobiles, and Combination Bodies for the transportation of troops as well as materials.

Shortly after starting work on this equipment for the Russian Government, orders were received from the British, French and Belgian Governments for automobile bodies of various kinds, including Stake Bodies for handling hay

and grain, Transport Bodies for the transportation of materials, Combination Bodies for the transportation of troops and materials, and Tank Bodies for carrying fuel oil for aviation purposes. This class of work occupied only a small proportion of the Company's equipment, and it took orders early in the war for Shell Forgings for the Russian 75 millimeter gun, selling these completely machined ready for loading and application of the fuses. It also furnished for the British Government 6" shells similarly machined, as well as 6" Shell Forgings to be machined abroad.

During 1916 this Company had also furnished 3" and 4.7" Shells to the Frankford Arsenal at Philadelphia for the Ordnance Department, United States Army. During 1916, while the Mexican trouble was at its height, it furnished large quantities of automobile bodies for use on the Mexican border. These included Transport Bodies, Ambulances, and Portable Machine Shop Bodies, the latter being completely equipped with various types of metal cutting machines.

SEARCHLIGHTS

Prior to December 1916, three different types of Portable Searchlights had been developed, none of which had proven highly satisfactory, due to the extreme delicacy of the lamps, and the general unsatisfactory power outfits for the searchlights and some defects in the vehicles themselves. In December, 1916, the Company was

given a contract to develop a Limber and Caisson type Searchlight outfit, the limber to carry the power plant consisting of a gasoline engine and direct-connected generator of about 5-kilowatt capacity and the caisson to carry the elevating tower and searchlight. This tower was arranged to rest on elliptic springs for traveling on the road, and was capable of being tilted to an upright position and extended eighteen feet vertically when the limber was in operation. This was accomplished by means of a winch and cable mechanism. All the controllers of the lamp, including electrical control and movement of the lamp itself in elevation and azimuth control are operated from the ground. Mirrors were provided to show the exact condition of the arc to the operator on the ground, rendering him reasonably secure from gun-fire. The lamps proper used in these outfits were the first high intensity searchlights built and were designed and built for the Company by the Sperry-Gyroscope Company, of Brooklyn, N. Y., as our sub-contractors.

At the time the Armistice was signed the Company was at work on a Portable 60" Searchlight, mounted on a 30-ft. revolving tower on standard railroad flat car. Power for this lamp was supplied by two 25-kilowatt generators, direct connected to gasoline engines. These power plants also supplied power to motors on the axles of the cars, furnishing power to move the entire equipment on standard gauge railroad trucks from place to place. Sleeping quarters for the crew were provided in a box car alongside the power plant.

RAILWAY CARS FOR HEAVY GUNS

Early in 1917 the Brill Company was called upon to enter into the production of railway cars for transportation of heavy guns. Brill engineers spent several weeks at the Ordnance Department in Washington developing in detail the plan of a bridge-girder type of frame construction surmounted by a massive base for the gun and mounted on a pair of 6-wheel trucks. The cars were furnished complete, ready for installing the 16" gun.

AMBULANCES

Soon after the entrance of this country into the war, the Company built a number of standard U. S. Army ambulances for the Medical Corps, each to be mounted on a 3/4-ton automobile chassis.

It also built a number of small ambulance bodies suitable for mounting on a Ford chassis. These were sent to France soon after this country entered the war, and were used by the American Ambulance Corps for France. This organization with its equipment was afterwards absorbed by the Medical Corps, U. S. Army.

PORTABLE RADIO TELEGRAPH OUTFITS

In about 1915 the Signal Corps, U. S. Army, developed a Portable Radio Telegraph outfit, mounted on a 1-1/2 ton chassis. This outfit was taken over by the United States for experimental purposes, and then taken to the Mexican border and used on the line of communications in Mexico for several months. This outfit operated to such good advantage along the Mexican border that it was decided to

developed ten of these outfits with certain improvements which had been shown to be necessary. The Brill Company cooperated with the Signal Corps officials to this end, and the man who had operated the first outfit for some six months was sent to the Brill plant, and ten of these outfits were built. These outfits were placed along the eastern seaboard and operated jointly for some time. They were declared satisfactory and orders for large quantities were placed later, to be exact duplicates of these ten.

SIGNAL CORPS WIRE CARTS

The Signal Corps, prior to the Declaration of War, had in service a number of types of horse drawn wire carts used for carrying field telephone wire on power driven reels, and equipped with mechanism for reeling this wire and packing it up. None of these outfits had proved entirely satisfactory, and the Company was asked by the Signal Corps to attempt to overcome the difficulties encountered in previous designs. A satisfactory design was developed, and a large number of these was built during the course of the war.

BATTERY REEL AND CART.

Some years prior to the outbreak of the World War the Ordnance Department began experimenting on the horse-drawn reel for carrying telephone wire used in communication between field batteries. Several designs were worked up, some of which were built and experimented with, and at the entrance of this country into the war the Department had a partly built outfit for this purpose. This partly-

built outfit was sent to the Company's plant to be completed, and upon completion and test, was found to be satisfactory for the desired purposes. This outfit carries, in addition to the field telephone wire, complete field battery communication, range finding, shot plotting, and fire control equipments. An outfit of this nature became particularly valuable after the development of barrage fire to the highest stage to which it was developed during the last two years of the World War. Tests of this equipment proved so satisfactory for communication in barrage fire battery work, that large numbers of these outfits were ordered. The large number of these types required special conditions in the Company's plant, and the installation of many new tools, and a large amount of special equipment. It also became necessary as the value of this outfit became more fully appreciated, to establish an entire department, erecting new buildings for the execution of this contract, in which several thousand men were employed. At the time the Armistice was signed the Company was delivering at the rate of about sixteen to twenty sets of equipment per day.

PRINTING PRESS OUTFITS

The Engineer Corps found it necessary early in the war to supply six-color printing presses to supply the daily maps furnished the officers at the front. At the request of the Engineer Corps this Company developed an

automobile body mounted on a five-ton truck with a heating system to keep the ink flowing freely, and celluloid windows to furnish sufficient light. These outfit were furnished mounted on the trucks, about three weeks after receipt of order.

WET RACKS

One of the difficulties encountered on the Mexican border was handling fresh meat without contamination. Working on a basis of ideas furnished by an officer who served in the Quartermaster's Department on the Mexican border, the Company built and furnished to the Quartermaster a rack fitted with sliding hooks for carrying meat and so arranged as to render it possible to enclose this rack so as to exclude dust and insects. The Company furnished all that were used by the American Expeditionary Forces.

ENGINEERS' TROL WAGONS

The Engineer Corps, prior to the entry of this country into the war, had used for the transportation of its tools, road equipment, pioneer equipment and demolition equipment, a large covered wagon known as the Brown-Tight Tool Wagon. This is a large, heavy 4-wheel wagon. Soon after we entered the war officers of the Engineer Department were told by French and British Liaison Officers that it was impossible to drive wagons of this kind

at the front, due to the fact that they would break in two in going through shell holes, and that it would be necessary to develop a limber and caisson type of vehicle for this purpose. At the request of the officers of the First Regiment of Engineers, we designed and built the first of these wagons, delivering the first outfit for their inspection and acceptance in three days. This first outfit was accepted and an order placed, and the Company reached production in sufficiently short time to enable the First Regiment of Engineers to take abroad some of these outfits about one month after order was placed. The Company continued building these at the rate of fifteen to twenty outfits per day up to the time that the Armistice was signed.

PANTS, LIMBERS, FIRING PLATFORMS.

As sub-contractors of the Midvale Steel & Ordnance Company, the Brill Company filled several orders for 8" Howitzers on firing platforms prior to the entry of this country into the war. These were built for the British Government. Upon our entry into the war the U. S. Government accepted the British design, and we continued to build these outfits as sub-contractors of the Midvale Steel Company to be furnished this country.

The firing platform has a large area built of heavy lumber sheathed in steel. It was intended to mount the gun on this structure on muddy ground so as to prevent

the spade of the gun trail being hammered into the ground by the recoil, altering the direction of fire.

TRENCH MORTARS

The Brill Company, under the direction of Lieut. Sutton of the British Army, who was assigned by the British Government to the Ordnance Department as a Liaison officer, built an experimental 11" trench mortar. This trench mortar, which was tested extensively at Sandy Hook and later at the Aberdeen Proving Grounds, was declared satisfactory, and orders were to be placed at about the time the Armistice was signed.

Following the same direction the Company also built a 3" trench mortar of similar design. Some of these were over purchased as the Armistice was signed prior to their acceptance.

LIBERTY MOTOR CYLINDERS

In August, 1917, the Aircraft Production Department took up with the Brill Company their requirements for Liberty Motor cylinders. At the time these cylinders were designed, there was a great deal of discussion as to the satisfactory method of manufacture. The Company determined to make these from the solid billet, the method being briefly as follows:

A round billet, approximately 8 1/2" diameter by 10 1/2" long, is put into the furnace, brought up to forging

heat and pierced in a manner similar to that followed in the manufacture of 6" shells. After the billet is pierced, leaving a solid bottom which is later to form the cylinder head, the forgings are cut to an even length, and then reheated and the head is formed on a large upsetting machine forming the valve seats and spark plug lugs. The opposite end is now reheated and put in a large upsetting machine to form the flanges for bolting the cylinder down to the crank case. These cylinders are now annealed, rough bared, rough turned and heat treated, before being offered for inspection. After inspection these are delivered to the engine builders for final machining. To accomplish the forging operations, extraordinarily large forging machinery is required, the pressing operation being done on the power, or hydraulic process, ranging from 550 tons to 2000 tons. The head and flange operations are accomplished in 6" and 7" forging machines, the latter being the largest forging machine ever built.

RELIABILITY

During the entire course of the war the Company was in very close touch with practically every department of the service, and as its facilities were varied it was asked at various times to furnish various minor items of equipment which were required for very quick delivery. These consisted of Carpenters' Chests for the Ordnance Department, Saddlers' Chests for the Ordnance Department,

Tent Squares for the top of tents for the Quartermaster Department, Supply Wagons for Searchlight Troops, Repair Wagons for the Medical Corps, Tent Slips, Adapters for 12" Shells, heavy Tool Wagons for Engineers, and numerous items of small parts and equipment.

THE PRIORITY ORDER SYSTEM

Before the system of priority orders was instituted by the War Industries Board, considerable difficulty and delay was experienced in obtaining material, usually traceable to the inability of the railways to furnish transportation. It was frequently found, on investigation, that other manufacturers of war material shared the same experience of the Brill Company of getting quickly into production and having large quantities of finished equipment ready for shipment but unable to obtain railway transportation to move them to their destinations. The conditions were, of course, greatly aggravated by the severe winter of 1917-18.

Unfortunately the priority order system did not become operative in a practical manner until such a late date that it was of little benefit. In the assignments of the Priorities Board there appeared to be a serious lack of realization of the relative importance of contracts.

BRILL PLANT OUTPUT 100 PER CENT. WAR MATERIAL

Early in 1918 the Brill plant was practically on a

100 per cent. war material production basis, including large orders of electric railway cars and trucks for the Emergency Fleet Corporation, for the transportation of employees to and from shipyards.

BRILL OFFICE ESTABLISHED IN WASHINGTON

In the summer of 1917 orders were being executed at the Brill plant for every department of the war except the Navy. Therefore, to facilitate matters, by keeping in direct contact with the various departments, the Brill Company established an office in Washington with an experienced member of the organization as representative, who remained until February 1, 1919.

CONTRACTS
ON
WAR MATERIAL PRODUCTION

SECTION 1 - OUTPUT

1. State kind of articles you supplied the War Department.

A- Our contracts were both direct and indirect, as we did work for the Midvale Steel Company, as well as for the War Department itself. For the Midvale Steel Company we built 8" Howitzer Limbers and 8" Howitzer Firing Platforms. Among direct contracts were aeroline cylinders, wireless units, ambulances, combat wagons, wire reels and carts, machine shop units, searchlights and field telephone units.

2. Quantity of each article contracted for.

A- United States Government contracts -

<u>Item</u>	<u>Quantity Contracted</u>	<u>Value</u>	<u>Quantity Delivered</u>
3/4-ton Motor Truck Bodies	3	1300.00	3
1 1/2-ton " " "	388	72418.00	388
3-ton " " "	2876	61886.00	2876
3 1/2-ton " " "	16	3825.00	16
4-ton " " "	156	35854.00	156
4 1/2-ton " " "	30	7500.00	30
5 1/2-ton " " "	276	61060.00	276
5-ton Light Repair Truck "	12	7300.00	12
5-ton Repair Truck Bodies	3	3074.00	3
4-ton Hoisting Bodies	3	1725.00	3
3-ton Hoisting Bodies	3	1100.00	3
5-ton Service Truck	31	14554.00	31
1 1/2-ton Telephone Body	1	6500.00	1
3 1/4-ton Workshop Bodies	3	1020.00	3
3-ton Machine Shops	64	26176.00	64
1 1/2-ton Radio Transceivers	80	77500.00	80
Motor Bus Bodies	2	3645.00	2
U.S. Standard Ambulances	80	27815.00	80
Ford Type Ambulances	9	1565.00	9
3-ton Stake Bodies	17	4666.00	17
1-ton Stake Bodies	9	2712.00	9
4-ton Stake Bodies	1	365.00	1
Artillery' Plates	584	24877.00	584
Artillery' Chassis	479	4786.00	479
Wool Packs	55	12475.00	55
3" U.S.A. Forgings	60900	140945.00	60900
4 1/2" U.S.A. Forgings	8000	10800.00	8000
3" U.S.A. Forgings	16615	39643.00	16615

<u>Item</u>	<u>Quantity Contract</u>	<u>Value</u>	<u>Quantity Delivered</u>
2.9" A.I.S. Forgings	25842	55800.00	35842
Special Wire Cart, S.C.	1	5116.00	1
Type K Wire Carts, S.C.	250	352000.00	250
34" Portable Searchlights	48	231504.00	48
Searchlight Supply Wagons	38	38960.00	38
Searchlight Running Gear	56	121992.00	0
Printing Press Bodies	10	6330.00	10
2 Trucks and Body	2	14472.00	0
Engineers' Tool Wagons	2165	1201355.00	2165
Engineers' Tool Boxes	250	150000.00	150
Aeronaut Cylinder Forgings	70000	1262500.00	60761
3/4-ton Trailer	1	1406.00	1
3-ton Trailer	1	3098.00	1
16" Howitzer Railway Mount	1	29193.00	1
Firing Platforms	96	130840.00	96
Trench Mortars	9	5479.00	9
Limbors for 8" Howitzers	165	142870.00	165
8-Horse Wire Carts	2396	636000.00	1637
Replacement parts for Wire Carts*		1900000.00	
Grating Wire Carts	1100	55000.00	1100
Pilot 2-horse Cart	1	5800.00	1

*Replacement parts only about 34% shipped - balance cancelled.

FOR FOREIGN GOVERNMENTS

1 1/2-ton Truck Transport Bodies	6	600.00	6
1 1/2-ton Transport Bodies	300	38750.00	300
2-ton Transport Bodies	2987	346101.00	2987
3-ton Transport Bodies	2262	291749.00	2262
3 1/2-ton Transport Bodies	100	85125.00	100
4-ton Transport Bodies	350	46060.00	300
5-ton Transport Bodies	61	7693.00	61
5-ton Tractor Trailers	30	19000.00	30
5-ton Machine Shop Bodies	126	152440.00	126
5-ton Machine Shop Bodies	25	52215.00	25
3 1/2-ton Machine Shop Bodies	2	4415.00	2
6-ton Machine Shop Bodies	60	110004.00	60
4-ton Depot Bodies	16	5040.00	16
5-ton Omnibus Bodies	80	17500.00	80
4-ton Omnibus Bodies	16	5250.00	16
5-ton Kitchen Bodies	70	63000.00	70
2-ton Water Tank Bodies	16	6400.00	16
How Pieces for 3" Shells	7000	11100.00	7000
6" A.I.S. Forgings	1000	525.00	1000
6" " "	100000	605000.00	100000
6" " "	147000	871800.00	85000
3" " "	400000	1200000.00	140150
3" " "	1500	5750.00	1500

3. Quantity of each article actually delivered.

A- Included in answer to No.2.

4. Total amount of all contracts.

A- For United States Government - \$15,938,117.00
For Foreign Governments - 2,761,982.00

5. Value of all deliveries.

A- To United States Government - \$12,748,848.00
To Foreign Governments - 3,300,461.00

6. Statement as to whether articles manufactured by your firm for the Government were the same articles as your peace time production.

A- The articles manufactured by us for the Government were entirely foreign to our normal production, as we are specialists in cars and trucks.

7. Show increased production over normal production.

A- We do not see how this comparison can be made, as the products during the war period were foreign to our products in peace times, and of an entirely different character, so that no actual comparison between quantities of the same kind can be made.

8. Include statement showing rapidity with which orders were filled after being received from the War Dept.

A- Our orders were handled with all possible speed and, when the elements involved were not beyond our control, we believe with special promptness. In some instances, orders were completed and shipped the same day as received.

9. Give statement showing amount of time cut off in the production of certain articles from the average time required to make these articles under peace conditions.

A- The answer given above to No.7 applies here, as we do not see that any comparison can be made.

SECTION 11 - WORKING AND NEW PRODUCTION

1. State whether your plant was in any way changed to meet Government requirements. If there was any change in plant, go into some detail as to nature of the

change, amount of money, necessary to make the change, etc.

- 1- An extension was made at the west end of our Truck Shop, and balconies erected in both side aisles and part of the center. A large number of machines were purchased and installed, part being Government property and part our own. The Pattern Department and Pattern Storage in the second floor of No. 15 building were moved to a new location, and a complete installation made here for handling special work. A new building, No. 52, was erected as an extension to the east end of Building No. 15. Improvements and additional machine facilities were made in the Main Tool Room, Smith Shop and Machine Shop No. 1, and better methods of handling material through the purchase of a new crane and electric tractors were installed.
2. State if there was any development in your plant of any new process or method of manufacture. If so, please treat this subject very fully.

- 1- As far as can be ascertained, there were no distinctly new methods of manufacture or new processes developed. It was simply a case of handling a new and unusual production in the most up-to-date and successful manufacturing manner.

SECTION III - PERSONNEL

1. State number of men called into the army from your plant, and show number of women employed to take their places.
 - A- There were 435 men called into the army, from this plant, and there were 512 women employed to fill these vacancies.
2. Show increase by months in personnel from April 2, 1917, to November, 1918.
 - A- Personnel of Plant from April, 1917, to November, 1918.

<u>Month</u> <u>1917</u>	(10 hour basis) <u>No. of Men</u>	<u>Payroll.</u>
April	1050	\$55,085.47
May	1198	107,348.61
June	1297	216,536.79
July	1427	119,892.81
August	1453	144,844.72
September	1476	137,848.24
October	1676	179,352.78
November	1942	194,006.94
December	2089	206,399.28

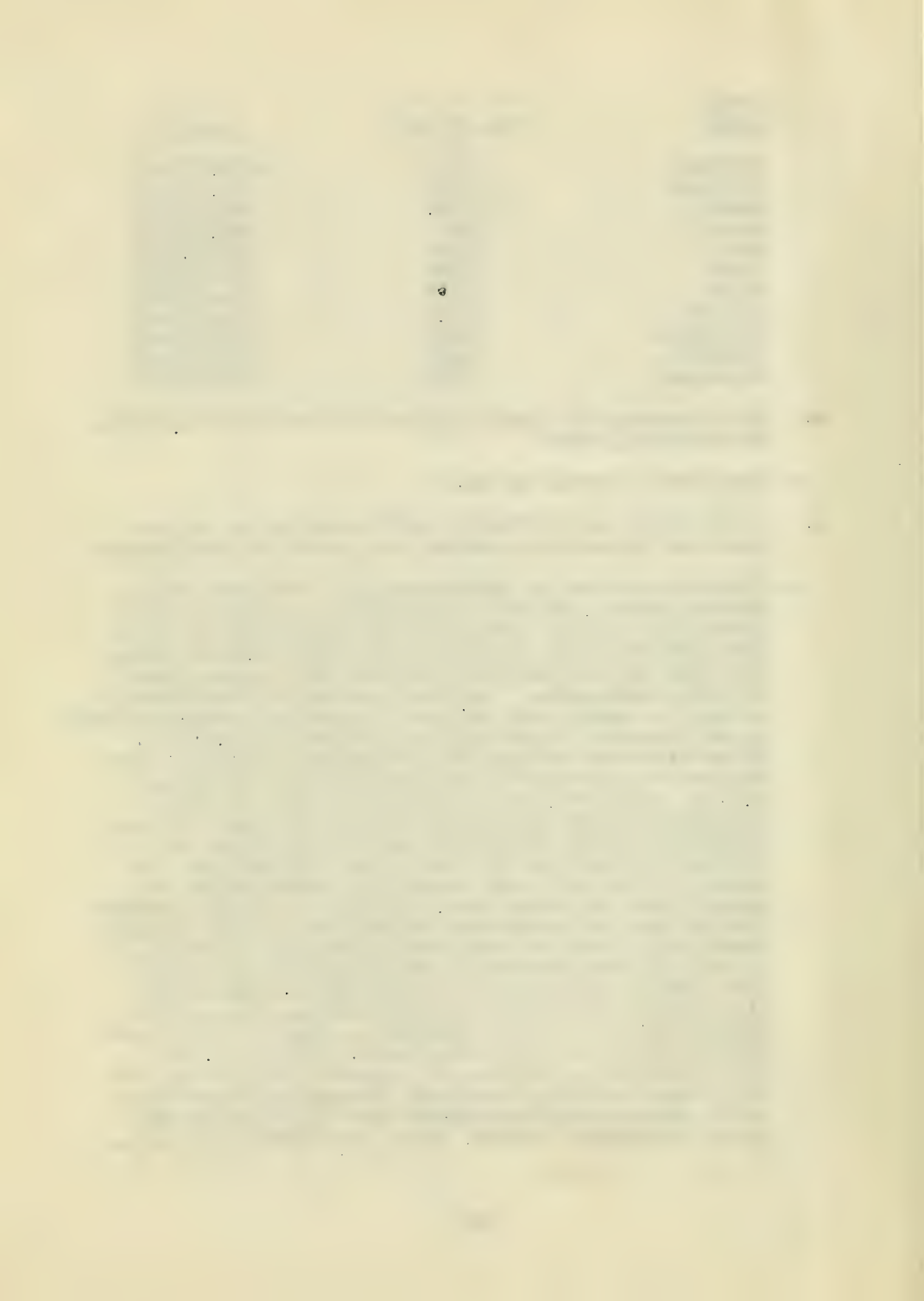
<u>Month</u> <u>1918</u>	<u>No. of Men</u>	<u>Payroll</u>
January	2071	\$236,464.71
February	2145	229,121.80
March	2154	250,865.04
April	2144	255,454.47
May	2274	303,152.57
June	2524	345,544.08
July	3036	366,810.71
August	3073	440,201.30
September	3343	485,549.22
October	2923	404,303.12
November	2961	571,802.06

3. Show increase in payroll by months from April 2, 1917, to November, 1918.

A- Included in answer to No.2

4. State fully any difficulty with labor which you may have had during this period, and manner of settlement.

A- This Company had no difficulty with its labor during the war period, with the exception of a demand made upon us by a small number of our machinists who were not satisfied with the rates which they were earning. The work on which these machinists were engaged were Ordnance contracts. When the machinists threatened to strike in August, the Ordnance Department sent mediators in an endeavor to secure a satisfactory adjustment. These mediators entered very thoroughly into the conditions as presented by the Company and the discontented machinists, and having found that the wage rates being paid were substantially the same as those prevailing in the Frankford Arsenal permitted the Company to continue its then prevailing policy. Inasmuch as the work upon which these machinists were engaged was cost-plus work, and for the further reason that it was not considered advisable to permit a wage scale which would attract machinists from adjacent plants who were engaged in war contracts, the mediators forbid this Company to yield to the excessive wage rates demanded by the machinists. The machinists continued at work, meanwhile carrying their contention up to the War Labor Board. The War Labor Board rendered a decision on November 20th to the effect that the rates being paid to machinists at the Brill Plant should correspond with those being paid at the Frankford Arsenal, which was already the case.



The machinists, however, ignoring the customary established procedure of the Government machinery in handling such matters, went on strike on the first of November. A mediator, Mr. John W. O'Brien, was sent to look into the merits of the case and harmonize the machinists and the Company. Mr. O'Brien decided that the machinists had acted arbitrarily and without justification when they went on strike; that in so doing they forfeited any claim they may have had as a part in the contest. Mr. O'Brien furthermore made a study of the rates being paid by us to our machinists and was satisfied that our scale was not below that of the Frankford Arsenal, which was cited in the War Labor Board's award as the standard by which we must be governed. With this exception we experienced no friction with any of our employees.

5. Statement as to difficulty in securing capable and efficient labor.

A- We experienced the same conditions of labor shortage and the applicants' lack of skill as was experienced by plants generally during the war period, but we maintained an adequate labor force by use of a labor recruiter, by advertisements, by working through our employees and by other well-known means. The recruits were usually only partially or not at all prepared to take up the positions upon which they were needed, but we gave them such training as was required.

6. Statement as to the practicability of the employment of women to take the place of men in your factory.

A- It is our experience that it is not practical to employ women instead of men in our class of work. This condition might be changed if they were given a course of training and made specialists along certain lines, but generalizing it is only in light work that they have done well, and then only in some instances. This can be accounted for in several ways, principally because they are of a weaker sex and their habits, health, etc., make them irregular attendants and not suited to tiresome manual labor.

HOUSES FOR OUR WORKERS

By reason of the action of the Emergency Fleet Corporation, which commandeered houses right up to our front gate, notwithstanding our urgent protest, and their failure to cooperate on our request, we were obliged to buy seventy-six houses, which, while they were not

as accessible to the plant as we desired, being twelve blocks distant and requiring the men to pay a centime, yet they were purchased and we rented to our employees fifty-six of them. The cabs were cleaned weekly by clerks, etc., and while we made an effort to dispose of these cabs with a view to placing these houses at the disposal of our own employees, we were stopped by the Real Administrator under a ruling from his Department which prevented our getting possession of more than fifty-six of the seventy-six.

As soon as the immediate necessity of holding these houses was passed, we disposed of them at approximately the price we paid for them. No effort was made to secure the higher prices which had been established by reason of the profiteering in real estate and the improvement of property in West Philadelphia which was being carried on by real estate men.

SECTION IV - MISCELLANEOUS

1. If there are any criticisms to be made as to the purchase, inspection or payment methods used by the Army, make these criticisms without reserve. That is wanted in an exact historical file, and frankness will be appreciated.
 - 1- We have no answer to make.
2. Give statement showing your methods of procurement and purchase of raw material, showing how you were affected by the War Trade Board, War Industries Board, Council of National Defense, etc.
 - 1- Before the system of priority orders was instituted by the War Industries Board, considerable difficulty and delay were experienced in obtaining materials, usually traceable to the inability of the railways to furnish transportation. Unfortunately the priority order system did not become operative in a practical manner until such a late date that it was of little benefit.
3. Show how the allocation of raw materials on priority demands affected your operations.
 - 1- While we made use of the priority system to some extent we were not dependent upon it for the procurement of raw materials. Our highly established lines of supply for raw materials had been developed during many previous years.

4. Trace in a few words any economic or sociological changes in your city or plant, which were due in any way to the war program.

a- In both our city and our plant the outstanding economic and sociological changes were:-

1. The advent of women into occupations heretofore considered exclusively as suitable for males, as machine operators, rivet headers, painters, etc.

2. The great increase in the earning capacities of families, by reason of increased individual earnings, and by reason of a larger proportion of the members of the families entering gainful occupations.

3. Economically, business flourished as never before.

4. Sociologically, those accustomed to depend on parents or others have been made self-reliant and to prefer the status of economic independence. Unfortunately, the rapidity of the increase of earning power, with the elimination of dependents, outstripped the rise in the standard of living or the appreciation of the opportunities of thrift, and all industry experienced among their employees an unprecedented irregularity of attendance upon and indifference to the obligations of the positions held.



Officers, Principal Executives and Foremen
of The J. C. Brill Co.
- 0 -

Samuel M. Curzon, President
Wm. R. Hallings, Jr., 1st Vice President
J. W. Howie, 2nd Vice President
Edw. F. Howie, Treasurer,
F. W. Brill, Asst. Treasurer
Henry C. Haling, Secretary
J. E. Poultney, Special Engineer
E. L. Gorter, Comptroller
R. B. Liddell, General Manager
W. M. Lysett, Purchasing Agent
E. C. Brill, Lumber Purchasing Agent
✓ H. J. Oswald, (in charge of Contracts & Orders)
C. J. McPherson, Superintendent
O. C. Kahler, Superintendent
F. J. Youngblood, (in charge of Planning & Tools)
✓ G. Gunster, (in charge of Tooling)
Chas. Atkins, (Gen'l Foreman, Forge & Blacksmiths)
• Geo. Metz, (Gen'l Foreman, Machine Shops)
• Samuel Dibdale, (Gen'l Foreman, Assembly & Erecting)
• Frank P. Miller, Chief Inspector
• J. McDevitt, (in charge of Production)
• C. F. Dundore, (in charge of Production)
• Joe. Becker, (Gen'l Foreman, Woodworking Dept.)
Victor Bernauer, (Gen'l Foreman, Cabinet Making)
• Joe. T. Durkin, (Gen'l Foreman, Heat Treating)

6 Theo. W. Gruner, Supervisor of Materials

S. H. Reid, Sterekeeper

6 John Powell, Sterekeeper

Robert McElvey, (in charge Loading & Shipping)

6 James Brooks, (in charge Drawing Room)

J. C. Leeper, (in charge Drawing Room)

6 H. S. Munson, (in charge Transportation)

C. E. Longstroth, (in charge Motor Transportation)

Mrs. Bessie McDannell, (in charge Female Employment)

H. C. Martin, (in charge Sheet Metal Pressings)

6 Harry Link, (in charge Sheet Metal Pressings)

6 Frank V. Clark, (in charge Instruments, Tools, etc.
Furnished by Gov't.)

Joe Bohner, (Gen'l Foreman, Die Dept.)

Peter Bohrer, (Foreman, Die Dept.)

Em. Buckley, (Foreman, Pattern Making)

Em. F. Weiss, (Foreman, Electrical Equipment)

✓ J. W. Patterson, (in charge Guards and Police)

LIST OF EMPLOYEES

WHO LEFT A FLOT OF COMPANY TO ENTER
GOVERNMENT SERVICE.

BRASS FOUNDRY

Antonio Scroll-----Army
Carl McGill-----National Guard
Charles Dudley-----"
Paul Jones-----U.S.Army

DIN

L. McDermott-----Army

CABINET

Anthony Berro-----National Guard
V. Collati-----"
Vincent Stranges-----Army
A. Collati-----"
E. Albertini-----"
G. Mullinero-----"
Joe. Franchina-----"
Nicola Diostillio-----"
Vincent Garari-----"
James Wioning-----"
P. Caden-----"
A. Pasco-----"
Allen Kyle-----Enlisted
Peter Quinshipi-----Army
H. Fernator-----"
Alexandre Mariatti-----"

DRAWING ROOM

J. Louis Fromm-----Army
E. N. Hoyt-----Quartermasters
James Hoag-----Engineers
Warren J. Pierce-----Aviation
Cyril Beech-----Enlisted
J. Pollakoff-----S.A.T.C.
Joseph J. Kelly-----Navy
A. M. Allred-----Army
E. T. Mueller-----"
Kiser Latchaw-----"
J. Osterlund-----"
Noy C. Farr-----Officer's Reserve
F. Simmons-----"

MEMORIAL

Herman Fleming	Army
M. Musciantonio	"
S. M. Clark	"
Ed. J. Sweeney	"
Sylvester Brodsky	"
Rebt. W. Fatten	"
Joe Doyle	"
Edward Shaffer	"

SHOOTING

Lawder Taylor	Army
A. Bouleauville	"
Rayd Breese	Navy
A. Butt	Army
Albert Schad	National Guard
A. Marina	"
C. Smith	"

FINISHING

Vincent Corcoran	Army
David Trabbold	"
S. E. Steel, Jr.	"
Charles Middle	"
Harry Sharp	"
Chas. E. Smith	"
John Hurwitzbeck	"
Wm. Reines	Navy
Harry Davis	Quartermasters
Joseph Blake	Aviation
E. Mottersley	"
J. Corcoran	Engineers
Lawrence Law	"
Peter Bradley	"
Ralph Collin	"
Clifford Casey	National Guard
Edward Kelly	Army
Ralph Ruenn	"

FORGE & SMITH

Edw. Smith	Army
Wesley Jones	"
John Milferdy	"
M. Tolsh	"
J. Graham	"
Samuel Young	"
Henry Pittila	"
Leslie Brooks	"
M. Burke	Merchant Marine
R. L. Peterson	Army
Clarence Henry	"
C. Jones	"
J. Bethke	"
J. Nelson	"
John Gustis	"
Chas. Williams	Navy
Sam. Wojenski	Army
Peter Donnelly	"
Wm. Hayes	"
Joe. Rolder	"
Ray Pace	National Guard
Thos. Milligan	Army
Wm. L. Milligan	"
Joe. Oliver	"
Wm. Hayes	"
J. Radinsky	"

LOUANS

D. Sanders	Army
George McGraw	"
F. Mullin	"

EAST YARD

Robert Doren	Army
Harry Thernston	"
Thomas Williams	"
Patay Paul	"
James Pagel	"
Henry Jones	"
Lewis Jackson	"
Bernardo Stello	"
A. Clark	Navy
Wm. Gallagher	Army
Louis Armstrong	"
R. G. Wells	"
Peter Accendandri	"
Wm. Wier	"

EAST YARD (continued)

Henry Andrews	Army
A. Strong	"
James Russell	"

MACHINE #3

B. C. Jones	Army
H. Pratt	"
W. McElinchey	Navy
Chas. C. Ryan	Army
Paul de Waseh	Red Cross
Richard Merrick	Army
Wm. Butler	Coast Artillery
H. Green	Army
Joseph Billici	"
Edward Rockwell	"
A. McInnes	"
John Garvie	"
Edward Kelly	"
J. W. Polar	"
Henry Kilde	"
F. Lockman	Royal Flying Corps
Thos. Jones	Army
John Connolly	"
A. B. Miller	aviation
James Rhine	Army
J. McElinchey	Navy
Higley	"

MACHINE #4

Ed. Willard	Army
C. Wismke	"
F. Idus	"
M. Templeton	"
Edw. Williams	"
B. DeLancia	"
John Downey	"
R. Thornton	"
A. Spencer	"
John Stonger	"

MIDNIGHT

R. Cavendish	Army
H. Dufare	Aviation Army
A. Falcony	"

PACIFIC #1

Thomson Spingeller	Army
Clas. Ford	National Guard
John Schaeffer	Army
Carl Smith	"
Earl Shaw	"
Paul F. Stansky	"
A. Doersch	"
A. Pascualacqua	"
S. Faltzsky	"
S. Maple	"
Petro Kaleda	"
E. E. Wago	"
Carriotto Geciano	"
C. Dayton	"

PACIFIC

Joe. Termini	Army
John Waters	"
Alver Harnak	"
George Plummer	"
John Cain	"

PACIFIC

F. Leghinton	Army
M. O'Rourke	"
J. Cize	"
Tom. Simsek	"
James Sharkey	"
Thos. Callahan	"
Frank Pauls	"
Robert Overly	"
Frank A. Crowley	"
Chas. Cohen	"
Edward Lawrence	"
Louis Arcoliani	"
Steve Krine	Artillery
Ed. Johnston	Army
Bernard Day	Engineers
Arthur Blair	Artillery
J. Nelson	Army

PACIFIC

Archie Macgregor	Artillery
Ivan Smith	Army
J. Wallace	"

FIRE & REPAIR

Wallace Mauls	Army
H. Abbey	"
Jos. Inverso	"
Edw. Jones	Naval Reserve
L. Dillinger	Navy
David Paynter	Naval Reserve
Michell Cox	Army
James Covey	"
H. J. Myers	"
H. B. Dobbs	"
John Judge	"

SEAT UPHOLSTERY

Walter Brown	Army
Louis Runig	"
Francis Haring	"
Chas. Edwards	"

SEAT UPHOLSTERY

A. Roerberle	Army
F. Wendler	National Guard
John Wallace	" "

SPRING & SEAT TREATING

L. Mariani	Army
Jos. Manuti	"
Oscar Pinder	"
Holt. Ems	"
C. Wendell	"
A. Bentley	"
H. Fernan	"
G. Childs	"
Wm. Mansfield	"
Thos. Powderly	Navy
T. W. Wimby	Army
Joseph Smith	"
J. Johnson	"
Jas. Morary	"
Stennis Lewis	"
John Taylor	"

ARMY & FINEST MEN

Edward Case	Army
E. Page	"
Marshall Beallie	"
Geo. Wilson	"
E. Marshall	"
F. Bettray	"
J. Carland	"
Wm. Steelman	"
Wm. McCervick	"
D. Charles	"
J. Odoriss	"
Philip L. Spiger	"
Carl Metz	"
G. Davis	"
M. Sefianowski	"

ARMY CAR

Hugh Martinello	Army
B. Lassl	"
J. Smith	"
Wm. W. Shaw	"
Louis Mallee	"
Tony Rose	"
Wm. Gardner	"
Chas. Mayman	Field Artillery
James Bielly	Army
R. Sancherry	"
D. Valpomi	"
James Foley	"

ARMY PRMP

Chas. Mendall	Army
Peter Dahlberg	"
J. Barges	"
E. Sellers	Naval Coast Defense
H. Jowett	English Army
J. Becker	Army

STORE ROOM & STORE YARD

Incl. Gov't Stores, Gen'l Stores, 20th St. Stores, Castg. Stores

W. McConnell	British Army
D. Green	Army
E. White	"
W. L. Woodard	"
Thos. Leims	"
Louis Jackson	"
C. G. Burney	"

STEEL RONI A STEEL YARD (continued)

A. Monichio	Italian Army
M. Manjaccio	
T. Viljoes	Army
Virgil Hollis	"
LeRoy Clark	"
M. E. Whitaker	"
L. Williams	"
Geo. Amerscn	"
Henry Lightfoot	"
E. Pasquith	"
Herbert Legue	"
W. F. Lee	"

SUPPLEMENTARY'S

Wm. B. Webb	Engineers
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TRUCK

E. Zimmer	Army
L. Vansciver	"
Chas. Keating	"
Jan. McGowan	"
Wm. Banchert	"
George Rock	"
Wm. Robitue	"
J. Meranti	"
W. Robson	"
Dan McKinley, Jr.	"
J. H. Robb	"
J. Duncoll	"
M. L. Johnston	"
W. Congrove	"
John Milton	Naval Court Defense
H. Johnson	Army
H. Reile	aviation
J. J. Millier	British Army
J. Wrench	Naval Reserves
J. H. Howard	Navy
A. Calabrese	Army
H. Platt	Tank Squad
Robt. Little	Army
H. B. Lewis	"
J. Simond	English Army
H. E. Hunter	Army
Theo. Haffman	"
John C. McHilling	"
John Kearney	"
P. Jacobvillio	Canadian Aviation
H. Coy	Engineers
E. Kester	Navy

TRUCK - (Continued)

L. Lansbery	Army
J. Collins	"
H. Davis	"
A. Folger	"
J. Seink	"
J. Hennepki	"

VAHISH

John O. Nelson	"
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WOOD HILL

John Kelley	Army
W. Taylor	"
Daniel Astolpi	"
D. Constantio	"
Eugene W. Appel	"
Dominic Costello	"
John Flynn	"
Angele Anticic	"
Angele Carmelo	"
James Moore	"
D. Logan	"
H. Lynch	"
Thomas Martin	"
Thomas Martin	Naval Reserve
M. McLaughlin	National Army
Frank Leo	" "

O HOLSTENT

Oscar Galloway	Army
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WIDE YARD

James Buckett	Army
E. T. Olanton	"
Antonio Palmela	"

MAIDEN Pk.

Frank Bagdonas	Drafted to work in coal mine
M. Masumie	Army
H. Foster	Nav
Joe. McDermick	Army
Tony Niece	"
A. C. Harbough	"
Horace Wallace	"
Sidney Edwards	"
T. A. Leck	Merchant Marine
Robert Nelson	Army
H. Sucher	"

MACHIN 15 (continued)

H. Wormley	Army
J. Fearkson	"
Joseph Intruglio	"
F. Hanson	"
Thos. Brown	"
E. Hunt	"
Chas. E. Huth	"
Frank Miller	"
Joe. Massine	"
F. E. W. Smith	"
Patrick Callahan	"
Edwin Froy	"
Vincenzo Fedinesco	"
M. Muratski	"
S. Allenman	"
Edward Nelson	"
Geo. Harrison	"
A. G. Coogan	"
J. Flaksen	"
M. McCann	"
W. E. Keffler	"
John Barrish	"
A. Cavensio	"
Ben. Heider	Merchant Marine
M. Brucker	Army
John Holmes	"
Geo. Weidman	"
W. E. Black	"
R. D. Stewart	"
Harry G. Reinhardt	"
Geo. Stiles	"
J. Garrity	Navy
John A. Latore	Army
E. Paole	"
Frank Berthberg	"
C. E. Keogh	"
W. Showere	"
Oliver C. Young	"
Ray Padon	"
R. Yetter	"
Sue Serefin	"
H. Heider	"
A. Hebert	"
A. Canning	"
Richard Merrick	"
D. Passacuo	"
John McCormick	"
C. Casey	"
W. Teras	"
Ralph Wendler	"

GENERAL MANAGER

A. M. Robinson

Quartermaster's

PURCHASING

Craig Turner

Quartermaster's

PUBLICITY

E. J. Knoch

Quartermaster's

SALES

Wm. J. Beatty

Officers Reserve

TIME & COST

Emil Leuff

Ambulance

R. Crawford

Navy

Wm. Mullen

Naval Coast Defense

Wm. Burr

National Guard

Wm. W. Famous

ACCOUNTING

Wm. J. Brophy

Military Police

SUPPLY

Geo. Dickinson

National Guard

Edw. Deal

Engineers

LABOR & ESTIMATING

F. Cassentino

Quartermaster's

W. J. Gallagher

National Guard

A. Holbrook

Engineers

John Brophy

Marine

WAR EQUIPMENT PRODUCTION AT THE PLANT OF THE
G. C. KUHLMAN CAR COMPANY, CLEVELAND, OHIO
SUBSIDIARY OF THE J. C. BRILL COMPANY

THE KUHLMAN PLANT

The plant of the G. C. Kuhlman Car Company, builders of all types of electric cars, is situated in Collingwood, Ohio, a suburb of Cleveland, on the Lake Shore & Michigan Southern Railroad. This railroad and the connecting lines of the Pennsylvania, Baltimore & Ohio and Wabash Systems, furnish adequate transportation facilities for shipment of cars to all sections of the country.

Business was started by the Kuhlman Company in 1901 and has expanded so rapidly that many additions to buildings and equipment have been necessary to keep up with its development. The plant at present covers thirty acres and the various buildings are models of their class so arranged that the progress of work through them is continuous to the shipping department. These buildings are equipped with the most approved type of machinery, suitable for the production of electric railway cars.

In 1904 the Company was purchased by The J. C. Brill Company, Car and Truck builders, and as a subsidiary of this pioneer of the industry, produces equipment of the same high standard of quality.

WAR EQUIPMENT PRODUCTION

Prior to the entry of the United States into the World War, the machinery required to produce the various car parts being suitable for turning out various motor truck material, the Kuhlman Company received several orders for this material from the Peerless Company, and several

additional orders have been placed since. This business in value aggregated about \$200,000.00, a large portion of the parts turned out being used on motor trucks for the United States Government.

In November, 1917, the United States Government placed orders with the Company for 600 type "B" motor truck bodies, valued at \$113,750.00. Other orders for motor truck bodies were also placed, including 600 type "B" in February, 1918, valued at \$143,000.00. The entire quantity of these three orders, 1800 motor truck bodies was completed and shipped.

The Company also received orders from the United States Government in August, 1918, for 1,000 artillery supply bodies, 1,000 spring chests, 1,000 wheel fastenings, and 1,000 mountings, total value \$436,000.00, but the estimate was signed and work suspended on these orders before shipments could be made.

The foregoing work was handled by the Kuhlman Company without alterations or additions to plant and equipment.

Further list of miscellaneous articles manufactured will be found contained in the list on page 40.

WAR EQUIPMENT PRODUCTION AT THE PLANT OF THE
AMERICAN CAR COMPANY, ST. LOUIS, MO.
SUBSIDIARY OF THE J. G. BRILL COMPANY

THE AMERICAN PLANT

The plant of the American Car Company, builders of electric railway cars, is located in the western suburbs of St. Louis, between the tracks of the Missouri Pacific, St. Louis, Iron Mountain & Northern and the Frisco System Railroads, an admirable location for the shipment of its product.

This plant was built in 1891, and covers an area of more than ten acres. It was purchased in 1902 by The J. G. Brill Company, and the number of buildings increased to properly handle the expansion in the business.

WAR EQUIPMENT PRODUCTION

Prior to the entrance of the United States into the war this Company received an order for 99 three-ton motor transport bodies, valued at \$15,500.00, of which 48, valued at \$7,500.00, were completed and shipped.

It also engaged in the production of Street Railway Cars for government organizations interested in transportation of employees of manufacturing plants and other enterprises to and from their work.

WAR EQUIPMENT PRODUCTION AT THE PLANT OF THE
WASON MANUFACTURING COMPANY, SPRINGFIELD, MASS.
SUBSIDIARY OF THE J. G. BRILL COMPANY.

THE WASON PLANT.

The plant of the Wason Manufacturing Company, builders of all types of cars for steam and electric railways, is located at Brightwood, Mass., a suburb of Springfield, occupying a twenty-one-acre tract of land along the tracks of the Boston & Maine railroad in the northwest corner of the latter city. It has an admirable location for foreign as well as domestic shipment due to its proximity to numerous shipping ports, with the result that Wason-built equipment, both steam and electric, can be found on many important foreign as well as domestic systems.

The Wason Manufacturing Company started business in 1874 at its present location for the express purpose of constructing steam railway cars, but its well organized and adequately equipped shops afforded excellent facilities for the construction of equipment for electric systems as well. Present total floor area of the plant is 195,000 square feet, and its equipment is capable of producing 300 standard passenger cars per annum, with an average employment of 400 people.

In 1906 the Wason Company was purchased by The J. G. Brill Company, the pioneer builder of electric railway cars and trucks, and this affiliation gave impetus to the already highly developed car-building activities of the Company.

ADAPTED TO WAR EQUIPMENT PRODUCTION

When the United States Government entered the war and the call was sounded for manufacturing facilities for various classes of war equipment, the general plan of the buildings at the Wason plant, the character of a large part of its machinery, and the specialized experience of its staff of employees, were quickly recognized as admirable for the construction of aircraft for which the government was in so great a need.

To properly handle this form of construction many important alterations and additions to buildings and equipment had to be made. The iron foundry building had to be changed to a shop suited to the production and finishing of various metal parts required in aircraft. Car Erecting building had to be specially equipped to provide for the application of linen to the wings, stabilizers, rudders, etc., and the doping thereof, which required the installation of a special ventilating system. Such woodworking machinery as would not be required had to be removed and stored. The Paint Shop building, having a floor area of 48,000 square feet, was suitably adaptable for rearrangement as a general assembly, packing and shipping department.

In addition, many alterations to the plant generally had to be made, such as removal of some railroad tracks, new concrete foundations and additional posts for supporting galleries and partitions to enclose sections

needed for receiving and store rooms, minor offices, coat rooms, rest rooms for women employees, also the increased number of employees, approximately one thousand, made necessary additional toilet facilities of the most modern type. Where necessary to maintain a high temperature in buildings, the steam heating system had to be overhauled and addition made. Electric group drive had to be installed for all machinery, replacing the line shafting steam engine drive method, and the lighting system had to be increased and extended. To provide adequate protection to the plant for engaging in war equipment production a fence had to be built, powerful electric lights installed, and guards properly stationed around the plant.

All of these alterations and new equipment required a considerable outlay of money, so it was deemed advisable to incorporate a separate company for carrying on this war work.

SPRINGFIELD AIRCRAFT CORPORATION.

Consequently, application was made and a charter granted September 27, 1917, to a corporation under the title of the Springfield Aircraft Corporation with a capital of \$600,000. To this corporation the Mason plant was leased. The contracts were then let for the necessary alterations and additions to buildings and equipment required for the production of aircraft, and orders placed for the necessary special machinery.

PRODUCTION

Commencing with an order for 400 JN4D Curtiss training planes, and spares for 400, in October, 1917, the Government placed order for 175 JN4D planes in June, 1918, 8 VE7 planes in August, 1918, and 300 JN4D planes in September, 1918, a total value of \$4,119,576.25. Of this number a total of 383 planes were shipped, valued approximately at \$2,660,000., and the balance of those on order cancelled by the Government soon after the signing of the armistice.

In producing these planes the entire Wason organization was absorbed by the Springfield Aircraft Corporation. With the signing of the armistice and the cancellation of orders by the Government, employees as relieved from aircraft work were immediately started in making arrangements for the production of steam and electric railway cars, and in affecting such changes in equipment as were necessary for the return of the plant to its peace-time occupation.

THE E. C. KIRKMAN CAR COMPANY

FOR THE UNITED STATES GOVERNMENT

<u>Item</u>	<u>Quantity Contract</u>	<u>Value</u>	<u>Quantity Delivered</u>
Motor Truck Bodies	50	5000.00	50
Truck Body Parts	955	22175.00	955
Mounting "A" Bodies on White Chassis	10	551.50	10
" " " " " "	140	9111.00	140
" " " " " "	3	277.50	3
Type "B" Transports	500	112750.00	500
" " " "	500	150000.00	500
Type "A" Bodies	1000	143000.00	1000
Tractor Seats	2000	41040.00	
Body Sides & Ends	400		
Supply Bodies	1000)		
Spring Chassis	1000)		
Wheel Fastenings	1000)		
Mountings	1000)	<u>254850.00</u>	

FOR FOREIGN GOVERNMENTS

Transport Bodies	75	5575.00	75
" " "	300	30000.00	300
Seats for Trucks	300	6000.00	300
Boxing	75	4875.00	75
" " "	150	8250.00	150
" " "	150	8250.00	150
Transport Bodies	55	9240.00	55
Truck Bodies	300	35000.00	300
Auto Parts	1000	36710.00	1000
Truck Bodies	10	5475.00	10
Auto Parts	1000	25850.00	1000
Misc. Parts		970.00	
Auto Parts	630	21000.00	630
" " "	630	23940.00	630
Small Dashers	250	2000.00	250
Hood Strips	500	270.00	500
Auto Parts	630	23940.00	630
Small Seats	100	1200.00	100
Small Dashers	100	810.00	100
Auto Parts	630	25955.00	630
" " "	630	25955.00	630
" " "	630	25955.00	630
Transport Bodies	5	937.50	5
Tarpaulins & Misc. Parts	15	730.00	15

For the United States Government

Completed contracts
Incomplete contracts

700475.30
400590.00

1101065.30

For Foreign Governments - Completed contracts

Total -

533400.50

1634465.80

THE AMERICAN CAN COMPANY

FOR THE UNITED STATES GOVERNMENT

<u>Item</u>	<u>Quantity Contract</u>	<u>Value</u>	<u>Quantity Delivered</u>
3-ton Motor Transport Bodies	99	\$15,500.	48

THE WILSON MANUFACTURING COMPANY.

FOR THE UNITED STATES GOVERNMENT

JN4D Curtiss Training Planes	400)		
Spares for JN4D Curtiss Training Planes	300)		
JN4D Curtiss Training Planes	275)		
" " " "	300)		
VE7 Planes	8)	4119576.25	565

August 25th, 1919

EVERY BRANCH OF ARMY SERVED BY BIG BRILL WORKS

Thirty-acre Plant Made Early
Start Supplying Needs of
Allies.

100-PER CENT. WAR WORK

United States Used Company's
Varied Facilities in a Hun-
dred Different Ways.

How Philadelphia accomplished the Herculean labor of producing more than two billion dollars' worth of war materials within a short space of time, more than one-sixth of the amount produced by the entire nation, is told in the series of articles of which this is the fifteenth. The articles are accurate in every respect, having been attested by the Ordnance Department to which they were submitted.

It may be said that the first distinctly American offensive was the reduction of the St. Mihiel salient, carried through from September 12 to September 15, largely by American troops, and entirely under the orders of the American commander-in-chief. In the attack the American troops were aided by the French colonial troops, who held a portion of the front line. We were also aided by French and British air squadrons.

The attack began at 5 in the morning, after four hours of artillery preparation of great severity, and met with success immediately. Before noon approximately one-half the distance between the bases of the salient had been covered, and the morning of the next day troops of the 1st and 8th Divisions met at Vigneulles, cutting off the salient within twenty-four hours of the beginning of the movement.

Between this engagement and that of the Battle of Gettysburg, two compari-

sons emphasize the magnitude of the action: At St. Mihiel about 550,000 Americans were engaged; the Union forces at Gettysburg numbered about 100,000. In three whole days at Gettysburg the Union artillery fired 33,000 rounds; St. Mihiel made a record for "concentration of artillery fire" by an artillery preparation of four hours, wherein was consumed more than 1,000,000 rounds of artillery ammunition.

The summary of this engagement reads as follows: The American commanders and troops demonstrated their ability to plan and execute a big American operation; a dangerous enemy salient was reduced; we captured 443 guns and 16,000 Hun prisoners. The offensive of St. Mihiel cost only approximately 7000 casualties, or less than one-third the entire Union losses at the Battle of Gettysburg.

Started Early at Brills.

The extensive plant of the J. G. Brill Company, in Philadelphia, covers a thirty-acre tract of land in the western part of the city, between the Southern lines of the Pennsylvania Railroad and Baltimore & Ohio Railroad. The entire tract is covered with steel and brick shops and buildings, lumber and steel storage sections, railways, traveling crane and other transfer equipment.

When, running at capacity production on its normal output of cars and trucks, Brill's employ about 3500 men. Their equipment of machinery and facilities for car and truck building are necessarily varied and comprehensive, embracing practically every class of machinery used in quantity production of large and small steel, brass and wood parts.

Soon after the outbreak of the world war, the Brill Company began the manufacture of material for war purposes; first making automobile truck bodies for the transportation of materials for troops. These bodies were of many kinds, and were designed at their plant under the direction of military commissioners sent to this country by Russia.

The type of bodies so furnished included motor transport or dorry bodies, portable kitchens, omnibus bodies, storage vans and combination bodies for the transportation of troops as well as of supplies.

Shortly after Brill's started work on this equipment for the Russian Government they received contracts for the British, French and Belgian Governments for automobile bodies of various kinds, including stake bodies for handling hay and grain, transport bodies for the transportation of materials, combination bodies for the transportation of troops and materials and tank bodies for carrying fuel oil for aviation purposes.

This class of work, however, occupied but a small proportion of this big Philadelphia company's equipment, and it took orders early in the war for shell forgings for the Russian 75-millimeter gun, completely machined and ready for loading. Brills also furnished the British Government with six-inch shells, completely machined, as well as six-inch shell forgings to be machined abroad.

During 1916, when the Mexican border trouble was at its height Brills furnished large numbers of automobile bodies

for use on the Mexican border. These included transport bodies, ambulances and portable machine shop bodies, the latter being completely equipped with various types of metal cutting machines.

Made Portable Searchlights

Prior to December, 1916, three different types of portable searchlights had been developed, none of which had proven highly satisfactory, due to the extreme delicacy of the lamps, and the general unsatisfactory power outfits for the searchlights and some defects in the vehicles themselves. In December, 1916, the Brills were given a contract to develop a limber and caisson type searchlight outfit, the limber to carry the power plant, consisting of a gasoline engine and direct connected generator of about five kilowatt capacity, and the caisson to carry the elevating tower and searchlight.

This tower was arranged to rest on elliptic springs for traveling on the road, and was capable of being tilted to an upright position and extended eighteen feet vertically when the limber is in operation.

The lamps proper used in these outfits were the first high intensity searchlights built.

At the time the armistice was signed J. G. Brill Company were at work on a portable sixty-inch searchlight mounted on a thirty-foot revolving tower on a standard railroad flat car. Power for this lamp was supplied by two twenty-five-kilowatt generators, direct-connected to gasoline engines. These power plants also supplied power to motors on the axles of the cars, furnishing power to move the entire equipment on standard gauge railway trucks from place to place, sleeping quarters for the crew were provided in a box car alongside the power plant.

Soon after the entrance of this country into the war, the Brill Company was called upon by the Ordnance Department to enter at once into the production of railway cars for the transportation of heavy guns. Engineers from the company conferred with the Engineering Division of the Ordnance Department, Washington, with a view of developing, in detail, the plan of a "bridge-sitter" type of frame construction surmounted by a massive base for the gun, and mounted on a pair of six-wheel trucks. The cars were furnished complete, ready for installing the sixteen-inch gun.

100 Per cent. War Work.

Early in 1918 the J. G. Brill Company's plant was practically on a 100 per cent. war material production basis.

In the Summer of 1917 there were orders being filled at Brill's for every department of the service except the navy. A summary of their achievements shows that they supplied war materials to our Allies before the United States entered the conflict and for a time after—to complete the work undertaken prior to April, 1917.

In studying the achievements of the great concern, nearly every branch of the army received material from their shops—ambulances for the medical de-

partment, portable radio telegraph outfits and wire cars (for carrying field telephone wire in power-driven reels), printing press outfits for the engineers' corps (for the printing, at the front, of six-color daily maps furnished the officers at the front). A notable achievement in this line was the developing of an automobile body mounted on a five-ton truck, with a heating system to keep the inks flowing freely, and celluloid windows to furnish sufficient light. These outfits were furnished the War Department, mounted on trucks, inside of three weeks after notice to go ahead.

To the quartermaster of the army Brills' furnished all the meat racks used by the expediting forces. This rack was fitted with sliding hooks for carrying meats, and so arranged as to render it possible to inclose this rack so as to exclude dust and insects.

To the Aircraft Production Department, they furnished Liberty motor cylinders, etc., etc., etc. Reels for carrying telephone wire used in communication between field batteries were designed by army ordnance, and a partly completed outfit was sent to Brills for completion. This outfit carries, in addition to the field telephone wire, complete field battery communication, range finding, shot plotting and fire control equipment. An outfit of this nature became particularly valuable after the development of "barrage fire" to the high stage achieved during the last months of the world war. Tests of this equipment proved so satisfactory for communication in barrage fire battery work, that large numbers of these outfits were ordered by the Ordnance Department.

This meant installation of many new tools and a large amount of special equipment. As the value of this type of outfit became more fully appreciated, it became necessary for the Brills to establish an entire department for its manufacture; new buildings were erected in which several thousand men were employed.

When the armistice was signed the J. G. Brill Company was delivering to the Ordnance Department from sixteen to twenty sets of this equipment per day.

Eight-inch howitzer on firing platforms were also among the important war products of the Brill Company.

The firing platform has a large area built of heavy lumber sheathed in steel. It was intended to mount the gun on this structure on muddy ground, so as to prevent the spade of the gun tail being hammered into the ground by the recoil, altering the direction of fire.

Samuel M. Curwen is the president of this great company, whose output was of such a valuable nature to the War Department in the crisis; William H. Henlings, Jr., vice-president; J. W. Rawle, second vice-president; E. P. Rawle, treasurer, and F. W. Brill, assistant treasurer. The secretary of the company is H. C. Esling.

In conclusion it may be said that practically every Philadelphia has ridden on a Brill-made trolley in Philadelphia, also that many Philadelphia lads rode toward the front in vehicles made here in the big plant in West Philadelphia.

ORDNANCE DEPARTMENT
OFFICE OF ORDNANCE DISTRICT CHIEF
1710 MARKET STREET
PHILADELPHIA, PA.

OFFICE OF CHIEF ~~DESIGN~~

WBW ML

TO INSURE PROMPT ATTENTION
IN REPLYING REFER TO:

NO. _____

ATTENTION OF _____

October 18, 1919.

From: The History Branch,
Philadelphia District Ordnance Office.

To: Mr. J. W. Rawle, 2nd Vice President,
The J. G. Brill Company,
Philadelphia, Pa.

My dear Mr. Rawle:

The writer has read with keen interest the "Brill History of War Work", covering, as it does, the J. G. Brill Company's effort in the Great War to defeat Prussian Autocracy.

The work referred to records another one of the many instances of the remarkable adaptability of American Engineering, and, taken as a whole, the war work of the J. G. Brill Company will furnish an extremely important part of the "Jig-saw Puzzle Picture", which, when put together by our future historian, shall picture the stupendous and glorious achievements of American ingenuity.

Sincerely,

William B. Williams

WILLIAM B. WILLIAMS,
CHIEF HISTORY BRANCH,
PHILADELPHIA DIST. ORD. OFFICE.



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